E. Feng (ANL): Higgs Total Width

- Measure Higgs total width using combined fit to all production modes and decay channels
- Lower limit on Higgs total width from sum of observed partial widths
  - Dominated by H->bb since expected BR(H->bb) ~ 57%
- Upper limit from capping the coupling strength to weak bosons: $\kappa_V<1.5$
  - Physically motivated assumption that high-mass VV scattering does not diverge
  - Stricter assumption $\kappa_V<1$ would produce proportionally stronger limit on width
- For 7-8 TeV sensitivity, consider simple model with one coupling strength to weak vector bosons ($\kappa_V = \kappa_W = \kappa_Z$) and another to fermions ($\kappa_F = \kappa_b = \kappa_t = \ldots$)
- For 14 TeV, consider more realistic model with separate b-quark coupling strength, κ_b
  - Scale sensitivity for total width according to precision on κ_b and κ_V
- Higgs total width can be determined to roughly 8-17% (4-12%) with 300 (3000) fb^{-1} at 14 TeV, depending how systematic uncertainties scale

Accelerator	Luminosity	$\Delta(\kappa_V)/\kappa_V$	$\Delta(\kappa_F)/\kappa_F$	$\Delta(\kappa_b)/\kappa_b$	$\Delta(\Gamma_H)/\Gamma_H$
LHC pp @ 7-8 TeV	25 fb^{-1}	7%	17%	--	20%
LHC pp @ 14 TeV	300 fb^{-1}	3-5%	--	7-15%	8-17%
" "	3000 fb^{-1}	1-4%	--	3-11%	4-12%